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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/082,554	02/25/2002	Lothar Bauch	1999P2628	3145

7590 09/06/2002

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EXAMINER

GREENE, PERSHELLE L

ART UNIT PAPER NUMBER

2826

DATE MAILED: 09/06/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/082,554

Applicant(s)

BAUCH ET AL.

Examiner

Pershelle Greene

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 February 2002.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☒ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 February 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All   b) ☐ Some \*   c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)                      4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)                      5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.                      6) ☐ Other: \_\_\_\_\_

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Serial Number: 10/082554

Attorney's Docket #: 1999P2628

Filing Date: 02/25/2002

Applicant: Bauch et al.

Examiner: Pershelle Greene

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the plurality of layers, the periodic basic grid, the one further metallization layer being formed adjacent one of the first and second layer, and the embedded DRAM must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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3. Claims 1, 2, and 8 are being rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As to claim 1, it is unclear how the plurality of layers relates to the structure being claimed.

As to claim 2, it is unclear what a periodic basic grid and how it relates the structure that is being claimed.

As to claim 8, it is unclear how the "one further metallization layer is formed adjacent one of the first or second layer.

As to claim 9, it is unclear how the embedded DRAM relates to the structure that is being claimed.

#### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-6 and 8, in so far as could be understood, are being rejected under 35 U.S.C. 103(a) as being unpatentable over Diewald et al. (U. S. Patent # 6,277,761), in view of Son (U. S. Patent # 6,072,242).

As to claim 1, Diewald et al. shows, in figure 2d, a contact structure extending through a plurality of layers and serving for electrically connecting regions of the semiconductor structure.

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The contact structure has a first contact hole filling V2 in a first layer, a second contact hole filling V1 in a second layer and an intermediate structure 112 in an intermediate layer disposed between said first layer and said second layer and connecting said first contact hole filling with said second contact hole filling. The intermediate structure forms an interconnect 112 having a length between longitudinal ends and a given width. There are contact areas at the end of each of the said longitudinal ends. Diewald et al. fails to explicitly show a contact area width greater than the given width.

Son is cited for showing a contact structure of semiconductor memory device for reducing contact related defect and contact resistance. Specifically, Son discloses, referring to figure 3, a contact structure pattern 56 with the contact area width greater than the said given width. It would have been obvious to one of ordinary skill in the art to use the contact structure pattern on Son with the intermediate layer of Diewald et al. for the purpose of reducing contact defects and contact resistance.

As to claim 3, claim 3 is being rejected for the same reasons stated above in regard to claim 1. In addition, Son discloses, referring to column 3 lines 50-55, the shape of the contact areas as being square.

As to claim 4, claim 4 is being rejected for the same reasons as stated above in regard to claim 3. In addition, the contact areas and that interconnect of Diewald et al. define a bone shaped form.

As to claim 5, claim 5 is being rejected for the same reasons as stated above in regard to claim 1. In addition, Diewald et al. discloses the intermediate layer and the intermediate structure being made of metal (refer to column 4 lines 32-35).

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As to claim 6, claim 6 is being rejected for the same reasons as stated above in regard to claim 1. In addition, Diewald et al. discloses, in column 4 line 60-63, that the contact hole fillings contain tungsten.

As to claim 8, claim 8 is being rejected for the same reasons as stated above in regard to claim 1. In addition, Diewald et al. shows, in figure 2d, a plurality of metal intermediate structures. The metal intermediate structures can be used to represent the metallization layer.

Claims 7 and 9, in so far as could be understood, are being rejected under 35 U.S.C. 103(a) as being unpatentable over Diewald et al. (U. S. Patent # 6,277,761), in view of Son (U. S. Patent # 6,072,242) as applied to claim 1 above, and further in view of Huang (U. S. Patent # 6,353,269).

As to claims 7 and 7, claims 7 and 9 are being rejected for the same reasons as set forth above in regard to claim 1. In addition, Huang discloses, referring to column 2 lines 39-42 and column 5 lines 45-50, an integrated semiconductor structure being an embedded DRAM. In addition, Huang discloses the insulating layers being formed of an oxide. It would have been obvious to one of ordinary skill in the art to use these features of Huang with the structure claimed in 1 for the purpose of preventing electrical degradation.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pershelle Greene whose telephone number is 703-305-3870. The examiner can normally be reached on M-F 8:30am - 5:00pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on 703-308-6601. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

PLG

August 29, 2002

NATHAN J. FLYNN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800

